The *PowerPro* ® (PRO3600)
Battery Charger Instruction Manual

Hall® Surgical

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Record the Model and Serial Numbers of the charger and date received. Retain for future reference.

Charger Model No.	_____	**Serial No**	_____	**Date**	_____
Charger Model No.	_____	**Serial No**	_____	**Date**	_____

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1.0 INTRODUCTION

It is recommended that personnel study this manual before attempting to operate, clean and/or sterilize the Hall® *PowerPro*® Battery Charger (PRO3600), batteries and accessories. The safe and effective use of this equipment requires the understanding of and compliance with all warnings, cautionary notices and instructions marked on the product, and included in this manual and any associated information insert.

1.1 Intended Use

The *PowerPro* Battery Charger is used to charge all *PowerPro* batteries, which includes the Sterile Transfer Batteries (PRO3115) and the Standard Large (PRO3010) and Small (PRO3020) Battery Packs, with or without the use of the SureCharge™ Sterilization/Charging Case.

The Sterile Transfer System requires that only the Sterile Transfer Battery Case (PRO3110) be sterilized, not the battery. The battery only needs to be cleaned, and then charged using the Sterile Transfer Platform (PRO3135). This eliminates the loss of charge in the battery due to the extreme heat of the sterilization environment. Once charged, the battery is transferred into the sterile battery case within the surgical field.

Standard batteries may be charged ***prior*** to sterilization by placing the battery pack directly on the battery charger. Or, they can be charged ***after*** sterilization by placing them in the SureCharge Sterilization/Charging Case. Charging the battery packs ***after*** sterilization prevents a loss of charge in the battery due to the extreme heat of the sterilization environment, thus allowing for longer use during surgery. When battery packs are charged ***after*** sterilization, they can either be transferred to the sterile field via the use of the SureCharge Sterilization/Charging Case or stored ready for use.

1.2 General Warnings

1. This equipment is designed for use by medical professionals completely familiar with the required techniques and instructions for use of the equipment. **Read and follow all warning and cautionary notices and instructions marked on the product and included in this manual**.

2. Do not open the battery charger, as this may void the warranty. There are no user-serviceable parts inside. Removing the cover may introduce an electric shock hazard by exposing you to dangerously high voltages or other risks.

3. Do not expose the battery charger to moisture, operate in wet areas, or place liquids on or above the unit.

4. Prior to use, inspect all equipment for proper operation.

5. Do not handle the battery charger by the cord. Do not pull on the power cord or accessory cord to remove it from the battery charger or the power outlet.

6. Do not excessively bend or kink the battery charger power cord or accessory cord. Always inspect cords for signs of excessive wear or damage. If wear or damage is found, discontinue use and replace immediately.

7. Do not expose batteries to fire or incineration.

8. Do not short circuit the battery pack metal contacts or allow them to contact metal objects. This could cause a shock or burn injury and also damage the battery.

9. Inspect battery pack for damage (i.e., cracks in battery case) prior to use or charging. Do not use or charge damaged battery packs. If battery pack is damaged and leakage or residue is noticed, do not allow it to come in contact with skin, eyes or clothing. These materials could contain Potassium Hydroxide (KOH) which is an alkaline and can burn. If leakage or residue comes in contact with skin or eyes, flush affected area with copious amounts of water and seek medical attention immediately.

10. Battery packs contain nickel cadmium or nickel metal hydride, which must be recycled or disposed of properly. The disposal of nickel cadmium or nickel metal hydride batteries as municipal waste is prohibited. Dispose or recycle in accordance with your local, state and government regulations. In the U.S. call 1-800-925-4255 for additional information on battery pack disposal or recycling. Outside the U.S. contact your local Linvatec representative.

11. After each use, thoroughly clean the charger (See **“3.1 Cleaning and Sterilizing” on page 16**).

12. Equipment grounding is vital to ensure safe operation. Plug the power cord of the battery charger into a properly earthed mains supply outlet whose voltage and frequency characteristics are compatible with those listed on the unit or in this manual. Do not use plug adapters or extension cords; such devices defeat the safety ground and could cause injury.

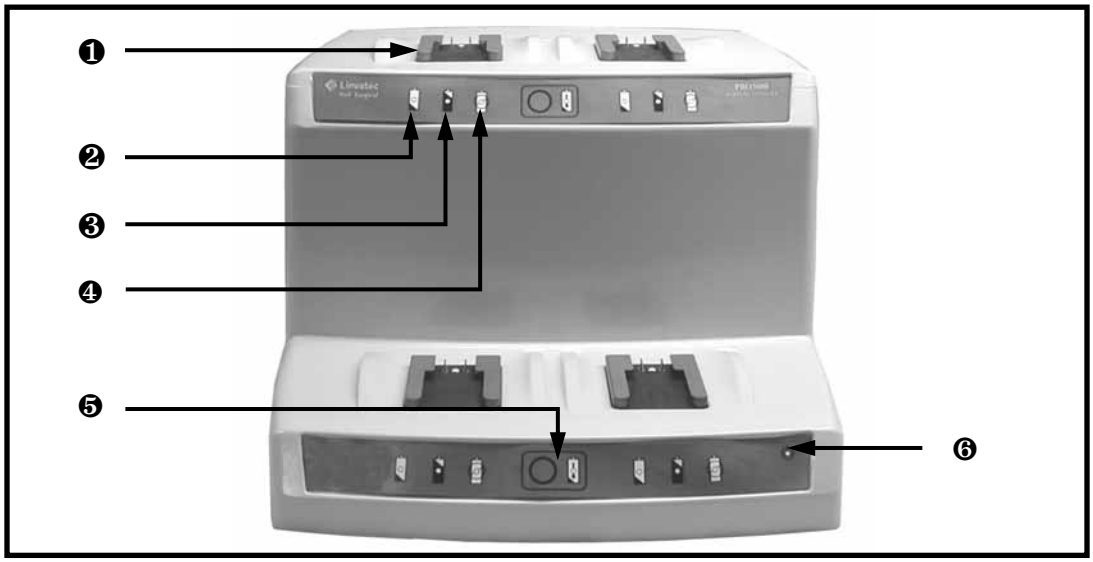
13. Do not use any equipment, especially the battery charger, in the presence of flammable anesthetics, gases, disinfecting agents, cleaning solutions, or any material susceptible to ignition due to electrical sparking.

1.3 Symbol Definitions

	Power “ON”, connected to mains.
	Power “OFF”, disconnected from mains.
	Power on, Stand-by mode.
	Attention, consult accompanying documents.
	Warning - For continued protection against risk of fire, replace only with the same type and rating fuse.
	Mains Fuse.
	Type BF equipment. Pertains to the Battery Pack.
	Alternating Current.
	Protective earth ground.
	User service not recommended. Refer servicing to qualified Linvatec service personnel.
	Indicates product component should not be sterilized.
	Indicates product component should not be immersed in any type of fluid.
	Warning: Burn potential. Caustic materials.
	Single Use Only.

	Indicates battery is being charged when illuminated.
	Indicates battery is fully charged when illuminated.
	Indicates a battery fault. See “3.2 Troubleshooting” on page 23 for more information.
	Indicates that a battery is going through a quick-discharge cycle when blinking, and remains constantly lit when completely discharged.
Rx ONLY	**Caution: Federal Law restricts this device to sale by or on the order of a physician.**

Batteries contain either nickel cadmium or nickel metal hydride which must be recycled or disposed of properly. The disposal of batteries as municipal waste is prohibited. Dispose or recycle in accordance with your local, state and governmental regulations. In the U.S. call 1-800-925-4255, or outside the U.S. contact your local Linvatec representative for additional information on battery disposal or recycling.



1.4 Battery Charger

1.4.1 Front Panel

❶ **Battery Receptacle Platform (4) —** Accepts the Sterile Transfer Battery Platform (PRO3135), used for charging Sterile Transfer Batteries (PRO3115); the Standard Large (PRO3010) and Small (PRO3020) battery packs; and the SureCharge Sterilization/Charging Case (PRO3200) used to charge standard battery packs after sterilization.

❷ **Charging Indicator Light —** Steadily illuminates to indicate the battery pack is connected and charging.

NOTE: Battery pack must be cooled to room temperature prior to charging. Failure to do this will result in increased charge time.

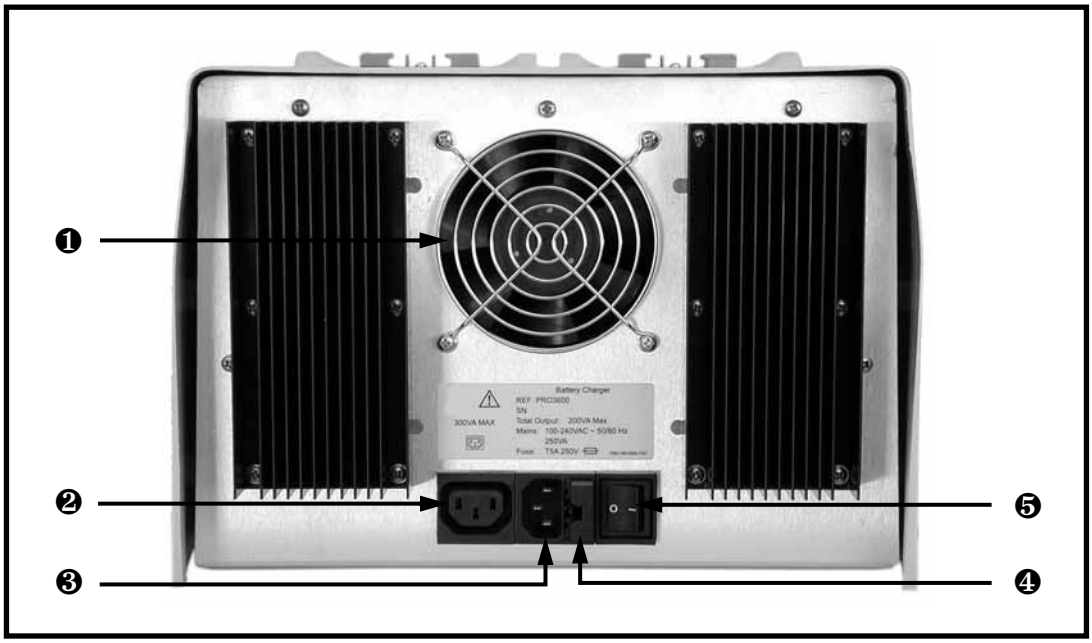
❸ **Charged Indicator Light —** Steadily illuminates when the battery pack is charged and the charging cycle is complete.

❹ **Battery Fault Indicator Light —** Steadily illuminates when there is a battery fault. See **"3.2 Troubleshooting" on page 23** for more information.

NOTE: During initial power up, all indicator lights will flash during the self-diagnostic test.

❺ **Discharge Button and Indicator —** Used to discharge standard battery packs prior to sterilization when using the SureCharge Sterilization/Charging Case. Depletes any residual charge that may be remaining in the battery. Discharge of the battery must be made within the first minute after the SureCharge Sterilization/Charging Case is attached to the battery charger. The indicator will blink during the discharge cycle and stop blinking when discharging is complete.

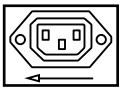
❻ **Power Indicator Light —** Illuminates when the power is in stand-by mode.



1.4.2 Rear Panel

❶ **Cooling Fan —** Removes heat build-up within the unit.

❷ **Accessory Outlet —** Allows for a second battery charger to be plugged into the primary charger using the accessory cord (PRO2601). **Do not connect more than one charger.**



❸ **Mains Receptacle —** Accepts the supplied hospital grade power cord to provide AC power.

❹ **Fuse Holder —** Contains two fuses. To replace fuses see **"3.3 Fuse Replacement" on page 26**.

❺ **Mains Power Switch —** Place this switch to the ON position to activate the charger.

2.0 BATTERY CHARGER OPERATION

NOTES:

1. **Batteries are shipped uncharged and non-sterile.**
2. **Always clean and sterilize batteries prior to charging. Refer to "3.1 Cleaning and Sterilizing" on page 16 or the information insert supplied with the battery pack for sterilization guidelines and parameters.**
3. **Charge batteries before initial use using only the *PowerPro* Battery Charger (PRO3600).**
4. **Do not charge batteries unless they are at room temperature. Failure to do this will result in increased charging time.**

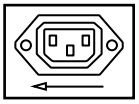
WARNINGS:

1. **Inspect batteries for damage prior to use, i.e., cracks in battery case. DO NOT use or charge damaged batteries. Discard or recycle properly.**

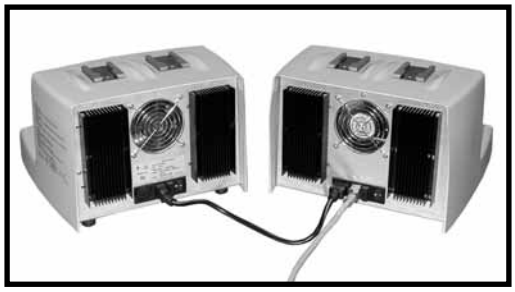
2. **Do not autoclave batteries above the recommended temperature, or leave them in the autoclave longer than recommended. See "3.1.7 Sterilization Information" on page 20 or the information insert supplied with the battery pack for sterilization guidelines and parameters. Damage to the battery pack could result, possibly causing injury.**
3. **Any of the above conditions could shorten the life of the batteries and/or compromise the seal integrity, resulting in leakage of Potassium Hydroxide (KOH) which is alkaline and can burn skin, eyes or clothing.**
4. **Do not allow battery leakage or residue to come in contact with your skin, eyes or clothing. If leakage does contact your skin, eyes or clothing, flush affected areas with copious amounts of water and seek medical assistance immediately. If there is any evidence of case cracking, white residue or fluid leakage, follow these guidelines:**
   (a) **Handle product with protective gloves.**
   (b) **Place battery in a leak-proof double bag, lined with absorbent material such as paper toweling. Secure the bag. If battery is damaged, package any loose parts in a separate bag to prevent short-circuiting.**
5. **Improper fuse size in the charger could result in fire. Replace only with time delay fuses as marked on the charger or listed in "3.6.1 Battery Charger (PRO3600)" on page 28 in the Technical Specifications section.**

1. Ensure the charger is turned off. Plug the power cord into the receptacle on the rear of the charger and a properly earthed mains supply outlet.

2. A second charger may be powered from the primary charger by connecting the accessory cord (PRO2601) from the second charger to the primary charger's accessory output.



NOTE: Do not connect more than one charger.



3. Using the power switch located on the back of the charger, turn the charger on. The green indicator light on the front of the charger will illuminate.

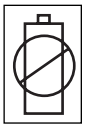
4. When initially turned on, the charger will perform a self-diagnostic test, at which time the LED's will blink and the charger fan will cycle on and off several times. When the charger has satisfactorily completed its diagnostic test, all LED's will go off indicating that the charger is ready for use. If any LEDs stay illuminated, see **"3.2 Troubleshooting" on page 23** for more information.

5. The charger icons and indicator light colors designate the following:

- Yellow: Battery is charging.

- Green: Battery is fully charged.

- Red: Battery fault. If the red LED illuminates, see **"3.2 Troubleshooting" on page 23** for more information.



2.1 Charging Standard Large (PRO3010) and Small (PRO3020) Battery Packs without the SureCharge Sterilization/Charging Case

NOTES:

1. **Always clean the battery pack prior to charging. Refer to "3.1.5 Cleaning Instructions for Standard Battery Packs" on page 19, or the information insert supplied with the battery pack. Charging must be performed prior to sterilization.**
2. **Battery packs must be cooled to room temperature prior to charging. Failure to do this will result in increased charging time.**

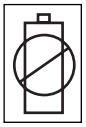
1. To charge a battery pack, perform the following:

   (a) Slide the battery pack onto one of the charger receptacles. Ensure it is seated completely in the receptacle. If it is not completely seated, a battery fault (red LED will illuminate) will result (see **"3.2 Troubleshooting" on page 23** for more information). Up to four battery packs may be placed on each charger.

2. Charging of the battery pack will begin automatically. During the charge cycle, the yellow "charging" LED will illuminate.

3. When the battery pack has completed its charge cycle, the yellow "charging" LED will go out and the green "charge complete" LED will illuminate. It takes approximately 55 minutes to obtain a complete charge.

4. If the red LED illuminates, or no LED illuminates, see **"3.2 Troubleshooting" on page 23** for more information.



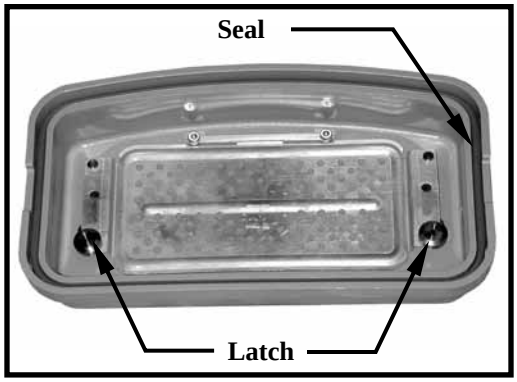
5. After charging, sterilize the battery packs. Refer to **"3.1.7 Sterilization Information" on page 20** or the information insert supplied with the battery pack for sterilization guidelines and parameters.
6. To remove the battery pack from the charger, simply slide it off.

2.2 Charging Standard Large (PRO3010) and Small (PRO3020) Battery Packs using the SureCharge Sterilization/ Charging Case

When using the SureCharge Sterilization/ Charging Case, cleaning and sterilization are performed on the battery packs ***prior*** to charging. Reference **"3.1 Cleaning and Sterilizing" on page 16**.

WARNINGS:

1. **Do not short circuit the SureCharge Sterilization/Charging Case contacts or allow them to come into contact with metal objects. This could cause a shock or burn injury, damage the battery pack and/or the charger.**
2. **Prior to sterilization, inspect the lid of the case. Ensure the seal is not damaged or missing. Ensure the filter is placed correctly within the designated area of the lid, and the filter bracket is latched correctly. Also ensure there are no tears or holes in the filter, as sterility of the batteries will be compromised and patient infection may occur. If there are any tears or holes, replace the filter.**



3. **Do not reuse filters. Filters are single-use only. Whenever the case is opened after sterilization the filter must be removed and disposed of properly.**

4. **Inspect the SureCharge Sterilization/ Charging Case for any damage, such as: damaged or worn connectors on the underside or within the case, faulty and/ or missing battery clips, cracks, dents, or broken latches. If damage is found, do not use. Sterility may be compromised and patient infection may occur.**

CAUTIONS:

1. **Always clean battery packs prior to placing in the SureCharge Sterilization/ Charging Case.**

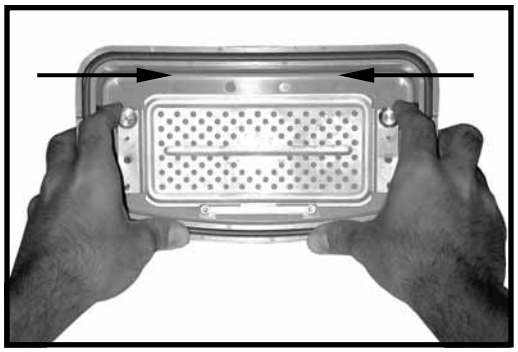
2. **Do not immerse any part of the SureCharge Sterilization/Charging Case in any fluids.**

3. **Charge batteries only on the *PowerPro* Battery Charger (PRO3600).**

1. ***Prior*** to sterilizing battery packs, remove them from the handpiece and clean them according to **"3.1 Cleaning and Sterilizing" on page 16**.

2. Place a new disposable filter onto the underside of the lid:

   (a) Remove the filter plate by pressing inward on the release knobs.



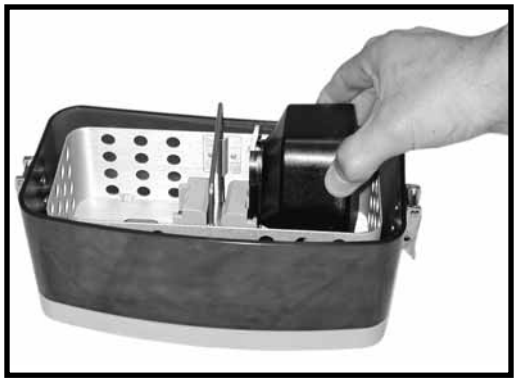
   (b) After removing the filter plate, install a filter by aligning the cutouts in the filter with the brackets on the underside of the lid.

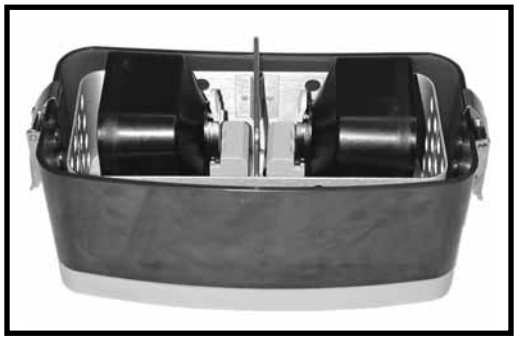
(c) Insert the flange of the filter plate behind the metal bar on the underside of the lid.

(d) Firmly press on the side tabs until both latches lock into place. A clicking sound must be heard from each latch.

3. Insert the inner basket into the outer case.

4. Slide the metal contacts of the battery pack into the receiving receptacle of the inner basket.





5. Attach and secure the lid to the case by engaging both side latches of the case lid.

Important: Battery packs must be cooled to room temperature prior to discharging them on the battery charger. Failure to do this will result in an increased discharge time.

6. Prior to placing the SureCharge Battery Sterilization/Charging Case in the autoclave, and after the battery packs have cooled to room temperature, slide the case onto the PowerPro Battery Charger.

7. Press the discharge button to deplete any residual charge remaining in the battery pack(s).

NOTE: Discharge of the battery packs must be made within the first minute after the case is attached to the charger. Once the charging process begins, the discharge button becomes inoperative.

(a) During the discharge cycle, the associated yellow LED will blink. When the battery packs are completely discharged, the associated yellow LED will illuminate steadily.

8. Remove the SureCharge Battery Sterilization/Charging Case from the battery charger and place it in the autoclave. See **"3.1.7 Sterilization Information" on page 20**.

9. After sterilization is complete, and the battery packs have cooled to room temperature, they can be charged. To charge the battery packs:

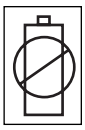
Important: Battery packs must be cooled to room temperature prior to charging them on the battery charger. Failure to do this will result in increased charging time.

(a) Slide the SureCharge Battery Sterilization/Charging Case onto the PowerPro Battery Charger.

(b) Charging of battery packs begins automatically. During the charge cycle the yellow "charging" LED will illuminate.

(c) When battery packs are completely charged, the yellow "charging" LED will go out and the green "charging complete" LED will illuminate. It will take approximately 55 minutes to obtain a full charge.

(d) If no LED illuminates, or the red (replace) LED illuminates, reference **“3.2 Troubleshooting” on page 23** for more information.



(e) If all three LEDs flash, this is a system fault. Reference **“3.2 Troubleshooting” on page 23** for more information.

(f) After battery packs are charged, the case may be removed from the charger and stored ready for use.

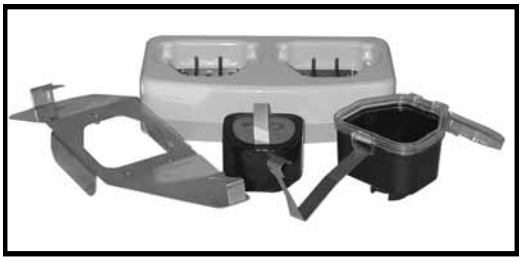
(g) Note that nickel cadmium batteries lose approximately 15 - 20% of their charge per month during storage in nominal room temperature. Recharge periodically to ensure use of a fully charged battery.

10. The circulator will remove the case from the charger, remove the lid from the case, then present the case to the scrub person.

11. The scrub will grasp the handle of the inner basket, remove it from the case, and place it within the sterile field.

12. The scrub will remove the battery pack(s) from the basket and attach one to the handpiece.

2.3 Charging Sterile Transfer Batteries



NOTES:

1. **Only the battery case (PRO3110) and shroud (PRO3130) require sterilization. Refer to “3.1.7 Sterilization Information” on page 20, or the information insert supplied with each battery case for sterilization information.**
2. **Do not sterilize the battery (PRO3115).**
3. **Never charge the battery while it is in the battery case (PRO3110).**
4. **The battery can only be charged using the Sterile Transfer Platform (PRO3135).**
5. **Always clean the battery and battery case after each use and prior to charging the battery.**
6. **Use only one battery and one shroud per battery case per procedure. Do not reuse the shroud without sterilizing it first. Do not put a second battery into the battery case without sterilizing the case first.**

1. To charge a battery, perform the following:

   (a) Slide the sterile transfer battery platform (PRO3135) onto the battery charger until it completely snaps into place.

   If the platform is not completely seated on the charger, a battery fault (red LED will illuminate) will result (see **"3.2 Troubleshooting" on page 23** for more information).

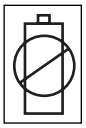
   (b) Insert the battery into a receptacle of the battery platform. Press on the battery until it completely engages in the platform.

2. Charging of the battery will begin automatically and will take approximately 5 to 70 minutes to fully charge each battery, depending on the amount of charge remaining in the battery.

3. During the charge cycle, the yellow "charging" LED will illuminate.

4. When charging is completed, the yellow "charging" LED will go out and the green "charge complete" LED will illuminate. The battery may be stored on the charger to ensure a fully charged battery, as long as the charger is left powered on.

5. If no LED illuminates, or the red LED illuminates, see **"3.2 Troubleshooting" on page 23** for more information.



6. After charging, the circulator will remove the battery from the sterile transfer platform on the charger.

NOTE: All nickel metal hydride batteries lose approximately 15-20% of their charge per month during storage in nominal room temperature. Recharge periodically if stored for any period of time to ensure use of a fully charged battery.

7. The scrub will place the sterile transfer shroud (PRO3130) onto the sterile transfer battery case. The pins on the underside of the shroud go on the outside of the case to center the shroud on the case.

8. The circulator will insert the battery through the sterile transfer shroud and into the battery case. Press the battery into the case until it is completely engaged.

9. The circulator removes the sterile transfer shroud from the battery case by pulling on either finger pull.

10. The scrub closes the lid of the battery case and flips the latch mechanism up and over the lid.

11. The scrub secures the lid by pressing first on the bottom of the latch, then on the front of the latch, ensuring the latch is fully engaged on the tabs of the Sterile Transfer Battery Case.

12. The scrub then attaches the battery case to the handpiece.

3.0 MAINTENANCE

Regular and proper maintenance of your *PowerPro* Battery Charger are the best ways to protect your investment. It is essential that you have your equipment serviced, as scheduled, in order to retain its optimum performance and reliability, which will reward you with safer, less problematic product performance over time. Linvatec recommends that the Hall *PowerPro* Battery Charger be returned to the factory for routine maintenance every 24 months.

Recommended care and handling of the battery charger includes proper day-to-day operation, cleaning, and sterilization which are extremely important to ensure safe and efficient operation.

Your authorized Hall Surgical service department is the most knowledgeable about the *PowerPro* instruments and will provide competent and efficient service. Service at Linvatec/ Hall Surgical at the recommended service interval is mandatory to keep your product warranties in effect. Any services and/or repairs done by any unauthorized repair facility may result in reduced performance of the instruments or instrument failure.

Failure to follow this routine maintenance schedule may result in damage to the battery charger and may invalidate the product warranty.

3.1 Cleaning and Sterilizing

CAUTION: Prior to cleaning and/or sterilization, always inspect batteries for damage or leakage. If any is found, discard battery. Do not attempt to repair. Batteries contain nickel cadmium or nickel metal hydride which must be recycled or disposed of properly. Disposal of batteries as municipal waste is prohibited. Dispose or recycle in accordance with your local, state and governmental regulations. In the U.S. call 1-800-925-4255. Outside the U.S. contact your local Linvatec representative for additional information on battery disposal or recycling.

3.1.1 Cleaning Precautions

1. Follow universal precautions for protective apparel when handling and cleaning contaminated instruments.
2. **Never immerse battery charger, SureCharge Battery Sterilization/ Charging Case, batteries, or power cords.**

3. Never clean equipment in an ultrasonic cleaner or combination washer/sanitizer.
4. Do not use bleach, chlorine based detergents, or caustic solutions that contain phenol to clean the SureCharge Battery Sterilization/Charging Case, battery case or battery packs.
5. Do not rinse batteries under running water.
6. Always remove battery pack from handpiece prior to cleaning and sterilization.
7. Always clean battery pack before inserting into the SureCharge Battery Sterilization/ Charging Case.

3.1.2 Cleaning Instructions for the Battery Charger

1. Turn the battery charger power off. Disconnect the power cord from the electrical power source and from the rear of the charger.
2. Remove any accessories from the battery charger that may be attached.
3. Wipe the battery charger with a clean, soft cloth dampened with a mild, pH-balanced detergent or alcohol. Repeat cleaning if necessary until clean.
4. At least once a week, thoroughly clean the contact points on the battery charger platforms. Use a cotton swab and a non-abrasive cleaning product that is approved for use with metal. Do not use products such as bleach or other corrosive chemicals.
5. Wipe equipment again with distilled or sterilized water.
6. Wipe dry with a clean, soft cloth.

3.1.3 Cleaning Instructions for the Sterile Transfer Battery Platform

1. Remove batteries from the Sterile Transfer Battery Platform.
2. Remove the Sterile Transfer Battery Platform from the battery charger.
3. Wipe the Sterile Transfer Battery Platform with a clean, soft cloth dampened with a mild, pH-balanced detergent or alcohol. Repeat cleaning if necessary until clean.
4. At least once a week, thoroughly clean the contact points on the underside of the Sterile Transfer Battery Platform, as well as the contact pins within each battery receptacle. Use a cotton swab and a non-abrasive cleaning product that is approved for use with metal. Do not use products such as bleach or other corrosive chemicals. Repeat cleaning if necessary until clean.
5. Wipe again with distilled or sterilized water.
6. Wipe dry with a clean, soft cloth.

3.1.4 Cleaning Instructions for the Sterile Transfer Shroud, Sterile Transfer Battery Case and Sterile Transfer Battery

After each use, clean the battery case. Clean the sterile transfer shroud as required.

1. Remove the Battery Pack from the handpiece before cleaning.
2. Remove the battery from the Sterile Transfer Battery Case before cleaning by pressing on the latch, as shown, to open the lid.

3. Open the lid and remove the battery by puling on the strap.
4. Wipe the Sterile Transfer Battery and Shroud with a clean, soft cloth dampened with a mild, pH-balanced detergent or alcohol. Repeat cleaning if necessary until clean.
5. Clean the Sterile Transfer Battery Case by wiping with a clean, soft cloth or brush dampened with a mild, pH-balanced detergent or alcohol. Remove all traces of blood and coagulated material, etc. Repeat cleaning if necessary until clean.
6. At least once a week, thoroughly clean the contact points on the battery case. Use a cotton swab and a non-abrasive cleaning product that is approved for use with metal. Do not use products such as bleach or other corrosive chemicals. Repeat cleaning if necessary until clean.
7. Wipe again with distilled or sterilized water. **Do not rinse under running water**.
8. Wipe dry with a clean, lint-free cloth.

3.1.5 Cleaning Instructions for Standard Battery Packs

1. Remove the Battery Pack from the handpiece before cleaning.
2. Remove all traces of blood and coagulated material, etc. by wiping with a clean, soft cloth or brush dampened with a mild, pH-balanced detergent or alcohol. Repeat cleaning if necessary until clean.
3. At least once a week, thoroughly clean the contact points on the battery. Use a cotton swab and a non-abrasive cleaning product that is approved for use with metal. Do not use products such as bleach or other corrosive chemicals. Repeat cleaning if necessary until clean.
4. Wipe again with distilled or sterilized water. Do not rinse under running water.
5. Wipe dry with a clean, soft cloth.

3.1.6 Cleaning Instructions for the SureCharge Battery Sterilization/ Charging Case

1. Wipe all surfaces of the SureCharge Battery Sterilization/Charging Case with a clean, soft, lint-free cloth or brush dampened with a mild pH-balanced detergent or alcohol. Remove all traces of blood and coagulated material, etc. Repeat cleaning if necessary until clean.
2. At least once a week, thoroughly clean the contact points on the bottom of the case and the charging posts inside the case. Use a cotton swab and a non-abrasive cleaning product that is approved for use with metal. Do not use products such as bleach or other corrosive chemicals. Repeat cleaning if necessary until clean.
3. The Case may be rinsed under running water, if necessary, and then wiped again with distilled water.
4. Dry with a clean, lint-free cloth.

3.1.7 Sterilization Information

Steam sterilization is safe and effective and has no contraindications for its use in sterilizing battery packs, sterile transfer battery cases, and the sterile transfer shroud.

3.1.7.1 Sterilization Warnings, Precautions and Notes

WARNING: The use of disinfecting solutions for an exterior instrument wipe will not sterilize equipment and is not recommended.

1. Do not sterilize battery charger.
2. Inspect battery pack before sterilizing for damage or leakage. If any is found, discard battery (see footnote 1 on previous page). Do not attempt to repair. The cells inside the battery pack pose an electrical and chemical hazard.
3. Do not sterilize equipment in cold sterilants like CIDEX.
4. Do not sterilize battery pack or sterile transfer battery case while connected to the handpiece.
5. **Ensure the lid of the sterile transfer battery case is fully open during sterilization.**
6. **Do not sterilize the sterile transfer battery, only the case. Exposure to heat may damage the battery.**
7. Do not leave Standard battery packs or the SureCharge Battery Sterilization/Charging Case containing Standard battery packs, in the autoclave longer than the recommended sterilization exposure times. Heat and age have the greatest impact on battery life. Strict adherence to recommended sterilization procedures is necessary. Any deviation from the recommended procedures may result in shortened battery life.Damage may result, thus shortening the service life.
8. Do not use battery packs or sterile transfer battery cases while warm. Allow adequate time for cooling prior to use. Do not immerse in liquid or cover with a damp cloth to cool. Cool by exposure to room temperature.

NOTES:

1. **The following guidelines do not guarantee that the device is sterile after the procedure. Your institution is still responsible for the normal sterility assurance validation.**
2. **Additional drying time may be required for complete heat and moisture dissipation. Operation of a handpiece with a battery that is not completely cool and dry may decrease performance and/or reliability.**
3. **Sterilization validation is based on AAMI guidelines (Association for the Advancement of Medical Instrumentation).**

All battery packs may be processed in a pre-vacuum steam sterilizer (Steam Pre-vacuum) or in a gravity (downward) displacement sterilizer (Steam Gravity).

The recommended minimum sterilization exposure times are as follows:

Table 1: Sterilization Parameters

Sterilization Type	Minimum Temperature	Minimum Exposure Time	Dry Time
Sterilization Parameters for sterilizing *PowerPro* Standard Large (PRO3010) and Small (PRO3020) Battery Packs			
Steam Pre-vacuum (wrapped/unwrapped)	270°F (132°C)	3 minutes	None
Steam Gravity (wrapped/unwrapped)	270°F (132°C)	3 minutes	None
Sterilization Parameters for sterilizing *PowerPro* Sterile Transfer Battery Cases (PRO3110) and Shroud (PRO3130)			
Steam Pre-vacuum (wrapped/unwrapped)	270°F (132°C)	3 minutes	8 minutes minimum *
Steam Gravity (wrapped/unwrapped)	270°F (132°C)	10 minutes	8 minutes minimum *
Sterilization Parameters for sterilizing the *PowerPro* SureCharge Battery Sterilization/ Charging Case (PRO3200)			
Steam Pre-vacuum	270°F (132°C)	3 minutes	8 minutes minimum **
*** CAUTION: An eight (8) minute minimum dry cycle must be run on the Sterile Transfer Battery Case every time it is sterilized. Failure to use a dry cycle on the Case may lead to reduced product performance or premature product failure. Operation of a battery that is not completely cool and dry may decrease performance and/or reliability.** **** CAUTION: The indicated dry cycle MUST be followed for the SureCharge Battery Sterilization/Charging Case. If not, a build-up of fluid may occur in the Case, possibly causing electrical shorting of the batteries and possibly compromising battery reliability.**			

3.1.7.2 Ethylene Oxide Sterilization Guidelines for Standard Battery Packs without the SureCharge Battery Sterilization/Charging Case

Pre Conditioning (1 hour minimum)

Temperature Setpoint:	54° ± 3°C
Humidity Setpoint:	50% ± 10%

Chamber

Temperature Setpoint:	54° ± 3°C
Humidity Setpoint:	60% ± 10%
Humidity Dwell:	30 minutes
Vacuum:	1.92 psia (3.9 in Hg)
EtO Concentration:	650mg/L ± 50 mg/L
Exposure Time:	2 hours
Aeration Ambient:	24 hours minimum

3.1.7.3 STERRAD Sterilization System Guidelines for Standard Battery Packs without the SureCharge Battery Sterilization/Charging Case

PowerPro Battery Packs (PRO3010 and PRO3020) are qualified for use in STERRAD Sterilization Systems.

3.2 Troubleshooting

Table 2: Troubleshooting

Symptom	Possible Cause	Corrective Action
Battery charger (primary or secondary charger) not functioning.	♦ Power cord unplugged or faulty.	♦ Plug in power cord. ♦ Replace power cord.
	♦ Battery charger(s) not turned on.	♦ Turn on power switch on battery charger(s).
	♦ Blown fuse.	♦ Replace fuse. See **"3.3 Fuse Replacement" on page 26**.
	♦ Accessory cord of secondary charger unplugged or faulty.	♦ Plug in accessory cord. ♦ Replace accessory cord.
	♦ Battery charger faulty.	♦ Return for service.
Sterile transfer battery will not begin the charge cycle and the red LED is NOT illuminated.	♦ Equipment is dirty or has loose electrical connections.	♦ Inspect the sterile transfer battery platform, battery, and charger for debris build-up on electrical connections. If found, clean and recharge.
	♦ Sterile transfer battery platform, battery, and/or charger is faulty.	♦ Inspect the sterile transfer battery platform, battery, and charger for loose mechanical connections or corrosion on electrical connections. If any of these conditions are found, **do not use**. If all inspections are normal, dispose of the associated battery properly. If any of these conditions are found on the platform or charger, have them serviced.

Table 2: Troubleshooting

Symptom	Possible Cause	Corrective Action
The red LED illuminates.	♦ Battery pack (PRO3010 or PRO3020) is not completely engaged in the receptacle on the charger.	♦ Verify that the battery pack is completely engaged in the receptacle on the charger.
	♦ The sterile transfer battery is completely inserted in the platform, but the platform is not completely engaged on the battery charger.	♦ Verify that the sterile transfer battery platform is completely engaged on the battery charger.
	♦ The sterile transfer battery is not engaged in the receptacle on the sterile transfer battery platform.	♦ Verify that the sterile transfer battery is completely engaged in the receptacle on the sterile transfer battery platform.
	♦ Trying to charge the sterile transfer battery while it is in battery case.	♦ The sterile transfer battery must be removed from the case and can only be charged in the sterile transfer platform.
	♦ Equipment is dirty or has loose electrical connections.	♦ Inspect all equipment for debris build-up on electrical connections. If found, clean and recharge.
	♦ Sterile transfer battery platform, battery, SureCharge Battery Sterilization/Charging Case, and/or charger is faulty.	♦ Inspect all equipment for loose mechanical connections or corrosion on electrical connections. If any of these conditions are found, **do not use**. If all inspections are normal, dispose of the associated battery properly. If any of these conditions are found on the platform, SureCharge Battery Sterilization/Charging Case, or charger, have them serviced.

Table 2: Troubleshooting

Symptom	Possible Cause	Corrective Action
The red LED illuminates (continued).	♦ The SureCharge Battery Sterilization/Charging Case is not engaged completely on the battery charger. ♦ Battery is faulty.	♦ Verify that the SureCharge Battery Sterilization/Charging Case is completely engaged on the battery charger. ♦ Remove battery from receptacle it is in and place on another receptacle. If charging LED does not illuminate, and red LED illuminates, battery is faulty. Dispose of battery properly.
No LED illuminates, but green power LED is on.	♦ Equipment (charger, battery, Sterile Transfer Battery Platform, SureCharge Battery Sterilization/ Charging Case) has intermittent / loose mechanical connections, corrosion or debris build-up on electrical connections, or high or low impedance connections or shorts.	♦ Inspect equipment (charger, battery, Sterile Transfer Battery Platform, SureCharge Battery Sterilization/Charging Case) for any of these conditions. If any are found, **do not use**. Replace associated piece of equipment.
Flashing yellow, green, and red LEDs on one or more platforms.	♦ Bad battery. ♦ System fault.	♦ Remove batteries and cycle the charger power. If system fault is cleared, the battery is bad. Replace the associated battery and dispose of properly. ♦ Remove batteries and cycle the charger power. If flashing lights are not cleared, the charger needs service.

3.3 Fuse Replacement

1. Turn the battery charger power off and disconnect the mains power cord.
2. Squeeze the latch on the fuse holder and remove it from the console.

3. Remove both fuses. Replace both fuses at the same time. Do not mix old and new fuses. Replace with the correct value, as stated on the battery charger or in the Technical Specifications section of this manual, that corresponds to the local voltage.

4. Reinstall the fuse holders and snap the fuse access door closed.

3.4 Ground Bond Test

The purpose of this test is to check the continuity of the ground bond from the power plug to the battery charger chassis whenever any maintenance has been performed.

Test Equipment Required:

Simpson Model 265 Multimeter or equivalent.

Procedure:

1. Set the multimeter to the lowest ohms range. Connect the test leads to each other and zero the instrument.
2. With the battery charger unplugged from the AC power source, connect one test lead to chassis ground and the other to the power cord ground pin. Measure the resistance value. The meter should measure less than 0.1 ohm.
3. If the reading obtained is greater than 0.1 ohm, the line cord or chassis wiring may be damaged. The battery charger should not be placed into service until the source of the problem is determined and corrected.

3.5 Leakage Test

The purpose of this test is to measure the amount of 50/60 cycle leakage from the transformer primary to the circuitry of the battery charger. The AC leakage from any exposed metal part to earth ground and from all exposed metal parts having a return to chassis must not exceed 300μa.

Test Equipment Required:

ED&D Leakage Current Tester, Model LT-601 or equivalent.

Procedure:

1. Plug the power cord into the back of the battery charger. Plug the battery charger power cord into the test instrument test receptacle.
2. Turn the battery charger on and allow to warm up a minimum of two (2) minutes.
3. Measure the leakage current.
4. Turn the battery charger and test equipment off. Disconnect all test equipment from the battery charger.
5. If leakage exceeds limits, the unit may have a faulty line cord or power transformer and should not be placed into service until the problem has been resolved.

3.6 Technical Specifications

3.6.1 Battery Charger (PRO3600)

I.E.C. Equipment Classification: Class I, No applied parts, IPX0 (ordinary). Continuous operation with intermittent loading.

Not suitable for use in the presence of flammable anesthetic mixture with air, oxygen or nitrous oxide.

The system was tested and complies with UL 2601-1, CAN/CSA C22.2 NO. 601.1, IEC 601-1, 2nd Edition including Amendments 1 and 2.

The system was also tested and complies with IEC 601-1-2 as follows: 1) The system may not cause harmful interference; 2) The system will accept interference received, including interference that might cause undesirable operation. If interference occurs, separate the instruments by moving one away from the other and if applicable connect the mains power cords to separate outlets. For more information contact customer service.

Linvatec Corporation is certified by TÜV Product Service to EN ISO 9001 and EN 46001 and to the Medical Device Directive 93/42/EEC with certificates for Annex II, Clause 3; Annex II, section 4 and Annex V.

Typical Operating Requirements:

Input Voltage:	100 - 240 VAC
Frequency:	50/60 Hz
Rating:	600 VA
Accessory Outlet Rating:	300 VA maximum
Battery Receptacle Output Voltage:	24 VDC max.
Line Frequency Leakage:	Less than 300μa
Fuse:	T5.0 A, 250 V, Time Delay
Dimensions (without battery packs):	12.5” (W) x 9.0” (H) x 14.0” (D) 31.7 cm (W) x 22.8 cm (H) x 35.6 cm (D)
Weight:	12.4 lbs. (5.6 kg)

NOTE: There are no toxic components used in the manufacture of the *PowerPro* Battery Charger. After the useful life of the product, dispose of components and service parts properly.

3.6.2 System Environmental Requirements

Operating:

Ambient Operating Temperature:	+ 50°F to 104°F (+ 10°C to + 40°C)
Relative Humidity:	30% to 75%
Atmospheric Pressure:	700 hPa to 1060 hPa

Transport and Storage:

Ambient Temperature:	- 40°F to 158°F (- 40°C to + 70°C)
Relative Humidity:	10% to 100% including condensation
Atmospheric Pressure:	500 hPa to 1060 hPa

3.6.3 Power Cord Requirements for Battery Charger

115 VAC:

Use only a listed (UL, CSA) detachable power cord manufactured to the following specifications.

- Plug End - NEMA 5-15P hospital grade, 15 amps, 125V
- Receptacle End - IEC 320/CEE-22, 6 amps, 250V/15 amps, 125V
- Cord - UL style SJT, 18 AWG, 3 conductor

230 VAC

- Plug End
  - Molded straight PVC plug with double grounding system
  - DIN 49441, CEE 7/U11, 10/16A, 250V
  - CEBEC, DEMKO, KEMA, NEMKO, OVE, SEMKO, VDE, UTE, FEMKO
- Receptacle End
  - Molded straight PVC plug
  - DIN 49457, CEE 22/V, 10A, 250V
  - VDE, D, N, S, SEV, OVE, KEMA
- Cord
  - PVC, 7.2mm diameter
  - 10A, 250V
  - Conductors: 3 x 1 mm^2
  - Conductor Colors - brown, blue, green/yellow stripe

3.6.4 Batteries

NOTE: Batteries contain nickel cadmium or nickel metal hydride which must be recycled or disposed of properly. The disposal of batteries as municipal waste is prohibited. Dispose or recycle in accordance with your local, state and governmental regulations. In the U.S. call 1-800-925-4255, or outside the U.S. contact your local Linvatec representative for additional information on battery disposal or recycling.

3.6.4.1 Standard Large Battery Pack (PRO3010)

Typical Operating Requirements:

Type:	Nickel Cadmium (8 cells)
Capacity:	1.25 amp hr.
Voltage:	9.6 VDC
Weight:	457 grams (16.3 ounces)

3.6.4.2 Standard Small Battery Pack (PRO3020)

Typical Operating Requirements:

Type:	Nickel Cadmium (10 cells)
Capacity:	0.5 amp hr.
Voltage:	12 VDC
Weight:	269 grams (9.6 ounces)

3.6.4.3 Sterile Transfer Battery (PRO3115)

Typical Operating Requirements:

Type:	Nickel Metal Hydride (8 cells)
Capacity:	2.1 amp hr.
Voltage:	9.6 VDC
Weight (without case):	396 grams (13.9 ounces)

3.7 Accessories

REF	Description
PRO3600	*PowerPro* Battery Charger
PRO2601	Battery Charger Accessory Cord, 18”
PRO2602	AC Power Cord, 115 VAC, 6 ft.
PRO2603	AC Power Cord, 230 VAC, 2 meters
C7104	AC Power Cord, 115 VAC, 10 ft.
C7105	AC Power Cord, 230 VAC, 3 meters
PRO3010	Standard Large Battery
PRO3020	Standard Small Battery
PRO3110	Sterile Transfer Battery Case
PRO3115	Sterile Transfer Battery
PRO3130	Sterile Transfer Shroud
PRO3135	Sterile Transfer Platform
PRO3200	SureCharge Battery Sterilization/Charging Case
PRO3205	SureCharge Battery Sterilization/Charging Case Disposable Filters (50/pkg)
PRO5090	System Sterilization Case

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